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The threat of expanding secrecy in technology

Laws restricting export of technical information are being applied to US university professors and scientists in ways that threaten both academic and scientific research freedom. The following assessment is taken from a background paper prepared for the Committee on Scientific Freedom and Responsibility of the American Association for the Advancement of Science.

By Stephen Unger

Historically, there have been two types of restrictions placed on scientific and technical information. The government has classified information relevant to military purposes, and the private sector has restricted access to information concerning commercially important processes and devices. The government has also controlled sensitive technical products through weapons and export control regulations.

Over the past few years, however, several governmental actions have been directed at broadening control to include not only the technical hardware but also the technical knowledge generated by private investigators outside the government. Growing government concern is also seen through its efforts to make United States technology in areas such as microelectronics and computer research less accessible to foreign nationals and to impose prior restraint on selected publications.

The growing field of cryptology [secret codes] is a case in point. Cryptology was, until recently, primarily used by the military, intelligence service, and diplomatic corps. However, large-scale digital communications, electronic fund transfers, the storage of huge amounts of data on individuals and businesses in computer banks, and the increased concern about privacy in general, has made cryptology a subject of much broader concern.

On several occasions federal officials have asked that technical papers involving encryption devices not be presented at scientific meetings. Patent applications for these devices have been delayed.

The government's arguments for concealing cryptology work are that open publication would endanger national security.

This has been challenged on the grounds that, because the US is so heavily dependent on electronic communications, a strong civilian capability in encryption and systems is necessary to prevent tage." It is also noted that this technology is much more important to the US than to the Soviet Union, which is far behind in the use of digital data systems.

In early 1980 the organizers of a scientific meeting on computer technology (the American Vacuum Society) and of a meeting on laser fusion (the Optical Society of America and the Institute of Electrical and Electronics Engineers) were asked by the US government to restrict participation of certain invited foreign nationals. Both meetings were held with some government controls imposed.

The US Senate has suggested that foreign students should be prevented from working with certain research programs involving high-speed integrated circuits. The large (probably more than one-third) proportion of engineering, physics, and computer science graduate students at American universities who are foreign nationals would make this restriction difficult, at best.

The constitutional conflicts over the government's right to classify nongovernmental information were well documented in the case of The Progressive, in which a journalist, working from unclassified documents, assembled information on the construction of the H-bomb. In this case, the government sought to classify the result of an independent researcher's work, not the documents used to support that work.

The overriding reason given to support secrecy in these and other areas of science and technology is national security. The military strength of the country has depended in large measure on the pre-eminent status of US technology. Yet, in recent years, fears have been expressed that we cannot continue to disseminate "know how" abroad without further eroding our leadership. Furthermore, America's technological predominance in the commercial sector has been called into question by nations such as Japan and West Germany. Why, proponents of secrecy ask, should sensitive industrial knowledge be exported?

An argument can be made that secrecy, in the pursuit of high-quality science and technology, does more harm than good.

But does secrecy actually promote security? The futility of trying to suppress scientific knowledge is illustrated by what happened in the early 1940s. Prior to the initiation of the Manhattan Project, American scientists agreed not to publish papers dealing with nuclear fission. Intrigued by this absence of publications, G. N. Flyorov, a Soviet physicist, assumed that the US government had begun a secret nuclear project and urged the USSR to do the same.

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Virtually all methods for effectively constraining the flow of information out of the country entail the imposition of restrictions on domestic circulation and publication as well. This would make duplication of efforts necessary, thereby slowing the process. Eventually, such a course of action could undermine the national security by weakening the nation technologically.

The exclusion of foreign nationals from university-based research would reduce the general pool of talented individuals at American universities. It would also have the more indirect effect of creating a feeling of distrust and ill will between this country and others.

Beyond these considerations is that of the traditional protections for freedom and openness that have always been part of American society and law.

Erecting significant new barriers to scientific communication and establishing precedents with respect to prior constraints on publication and speech would degrade valuable American tradition and detract from the example of openness that this country has set for the rest of the world. It would also harm one of the few existing strands of international cooperation: that which links scientists and engineers across national boundaries.

The threat of expanding secrecy in technology merits the serious attention of scientists and engineers, both as professionals and as citizens.

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